



Impact of an evidence-based online module on best practice in physical therapy for children with developmental coordination disorder: A mixed methods study

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ABSTRACT

Aims

This study evaluates the impact of a Developmental Coordination Disorder (DCD) evidence-based online module including synthesized resources, practical strategies, and interactive component on self-reported physical therapist (PT) knowledge, skills, and practice.

Methods

PTs from across Canada completed questionnaires before, immediately after, and 2 months following completion of the module. Questionnaires used 7-point Likert scale items and short open-ended questions; analyzes used paired t-tests and a thematic approach.

Results

Fifty PTs completed both pre- and post-questionnaires; 41 of these completed the follow-up questionnaire. Most items (79%) evaluating self-reported knowledge and skills increased significantly following module completion and this increase was maintained two months later. Most participants (92%) reported an increase in their confidence to provide DCD evidence-based services. Participants plan to modify their evaluative practices (e.g., involving children in goal setting) and their management of DCD (e.g., using best practice principles, providing resources to families and physicians). At the 2-month follow-up, 46% of participants had returned to the module to review information (e.g., video, resources) or to download handouts.

Conclusion

An online module developed collaboratively with PTs has the potential not only to increase PTs' knowledge, but also to support them in implementing evidence-based services for children with DCD.

BACKGROUND

It is well established that physical therapy (PT) practice should be evidence-based (Massey, 2003). In order for research evidence to be used by therapists, research findings need to be summarized and presented in clear and practical language, with concrete implications for changing clinical practice; this has given rise to the field of knowledge translation (KT). KT is defined as “a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve the health of [individuals], provide more effective health services and products, and strengthen the health care system” (Canadian Institutes of Health Research, 2012). Training PTs in research methods, and developing and disseminating short reports are popular KT strategies; however, both have been reported as having limited impact on changing practice when used as the sole KT intervention (Ketelaar et al., 2008; Schreiber et al., 2009). KT interventions that foster exchange between clinicians and researchers (e.g., collaborative research studies, knowledge brokering), that have interactive components embedded within them (e.g., blogs, communities of practice), and that use a variety of strategies and components have been reported to be more useful (David et al., 2012; Ketelaar et al., 2008; Rivard et al., 2010; Russell et al., 2010; Zidarov et al., 2013).

Recently, a growing interest in the use of the Internet as a platform for KT and exchange has emerged. Perceived advantages include easy access to information whenever (and wherever) clinicians need it, opportunities to proceed through materials at a self-determined pace, the use of multimedia for illustration, and the potential to engage participants in discussion (Curran and Fleet, 2005; David et al., 2012). Although online KT strategies have been used in a variety of settings, they may be most useful in situations where: 1) it would be difficult for PTs to come together in one location; 2) there is a need to increase general knowledge; 3) the evidence-based skills that need to be acquired relate to capacity-

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3 building and chronic disease management (rather than more direct hands-on skills); and 4) clinical
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5 resources are available to be shared virtually.
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10 The management of children with developmental coordination disorder (DCD) is an area of practice for
11 which using online KT strategies might be particularly useful. Despite the fact that DCD has been
12 recognized officially in the Diagnostic and Statistics Manual (DSM) since 1994, PT research in this field
13 is relatively new. According to the recently revised DSM, DCD is a chronic disorder affecting 5-6% of
14 school aged children, which is diagnosed when the following criteria are met: 1) the ability to learn and
15 perform motor skills is far less than that expected based on a child's age and experience, 2) the poor
16 coordination significantly impacts the performance of age-appropriate everyday activities, and affects
17 academic performance, employment, leisure, and play; 3) coordination difficulties are present from an
18 early age, and 4) the motor difficulties are not better explained by poor cognitive or visual impairments,
19 nor attributed to a neurological movement disorder (e.g., cerebral palsy) (American Psychiatric
20 Association, 2013). PTs have a critical role to play not only in identifying and supporting children with
21 DCD, but also in promoting overall health through encouraging participation in physical activity, and
22 health promotion. Traditional PT management of children with DCD, however, has focused primarily on
23 remediating underlying motor impairment (Niemeijer et al., 2007; Watemala et al., 2007). This
24 approach is ineffective, especially over the long-term, as it fails to emphasize the motor learning
25 processes necessary to facilitate the transfer and generalization of learned motor skills to real life
26 settings (Banks et al., 2008; Hillier, 2007). In a recent meta-analysis by Smits-Engelsman and colleagues
27 (2013), task-oriented approaches focusing directly on functional skills were reported to be more
28 effective in improving motor performance than process-oriented interventions addressing children's
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3 impairments. Research evidence about DCD PT best practice has however not been compiled in a way
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5 that is fully accessible to clinicians working in different practice contexts.
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10 This research aimed to address the evidence-to-practice gap through the development of an online tool to
11 support the evidence-based management of children with DCD by PTs. The objectives were to evaluate
12 the immediate and short-term (two month) impact of an evidence-based online DCD module tailored for
13 PTs on self-reported: 1) knowledge and skills, and 2) evidence-based practice (EBP).
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20 21 22 **METHODS**

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24 The Hamilton Integrated Research Ethics Board (HIREB) for Hamilton Health Sciences and McMaster
25 University approved this study.
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30 31 32 **Recruitment**

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34 PTs from across Canada who were working with children at the time of this study were eligible to
35 participate, with no previous exposure to children with DCD required. An electronic letter of
36 information describing the study was sent to PTs between February and April 2013 using four different
37 recruitment strategies to maximize the diversity of participants and to ensure they were reasonably
38 representative of Canadian PTs working in pediatric practice: 1) specific pediatric rehabilitation centers
39 were contacted in Ontario and centre PTs were invited to participate; 2) an email was sent to PT
40 members of the pediatric branch of the Canadian Physiotherapy Association; 3) PTs contacting our
41 research centre with queries regarding general information on DCD were invited to participate; and 4)
42 participants were asked to forward an email of invitation to others who they thought might be interested
43 in the study. As there is no easily-accessible, published Canadian registry of PTs working with children
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3 (including those with DCD), we cannot estimate the potential target group size; however, information
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5 about this study was sent to about 500 PTs in Canada. Participating PTs read a letter of informed consent
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7 and provided their consent electronically through an electronic survey. Following consent, users were
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9 provided access to the online module on a private site hosted by the study.
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12 13 14 15 **Design and KT Intervention**

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17 This study used a mixed-methods, pre-post design to collect information about the effectiveness of a KT
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19 intervention using an evidence-based online DCD module tailored specifically for PTs working with
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21 children. The “Knowledge to Action” (KTA) Cycle framework (Graham et al., 2006) guided this study.
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23 Research literature relevant for PTs was previously summarized by co-authors in a book chapter (Rivard
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25 et al., 2011); however more information was needed to identify and contextualize the specific content
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27 knowledge that was relevant for inclusion in an online module, as well as to identify PTs’ format
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29 preferences. Semi-structured informal interviews were thus conducted with PTs from across Canada and
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31 their recommendations informed the development of this module (details about the development of the
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33 module are reported elsewhere (Rivard et al., submitted). The module is comprised of five sections: 1)
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35 Identification; 2) Planning Interventions and Goals; 3) Evidence-Based Practice; 4) Management; and 5)
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37 Resources. Each of these five main sections is further divided into subsections, each consisting of five
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39 distinct elements including: 1) general information, key messages, definitions, explanations, and
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41 examples; 2) a case scenario “What About Max?” providing evidence-based clinical applications; 3)
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43 links to additional resources (e.g., downloadable one-page evidence-based flyers; web pages; or
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45 documents external to the module which might be of relevance); 4) videos demonstrating strategies
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47 and/or interventions; and 5) “questions for reflection” to challenge the user’s understanding of the
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49 information presented.
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Procedure

Following electronic consent to participate, participants were directed to the online pre-questionnaire, which was to be completed before reviewing the module, and then they were directed to the module itself. Participants were instructed to review the entire module at one sitting, if possible, and then to complete the post-questionnaire in order to ensure that possible differences in the pre- and post-questionnaires reflected the module's impact. However, if needed, PTs were permitted to view the module on more than one occasion. Participants accessed the post-questionnaire through a link on the last page of the module. The module could also be viewed (and in fact, was intended to be viewed) in a non-linear way, so a system tracking how PTs actually used the module (through electronic 'cookies') was developed. Once PTs had completed each of the five sections in any order, an invitation to complete the post-questionnaire appeared at the top of their screen.

Outcome Measures

Three questionnaires were used (pre-, post- and follow-up), with each containing items related to three variables: self-reported knowledge, skills and EBP. To compare changes in PTs' self-reported knowledge and skills, the same items were included in all three questionnaires (see questionnaire items in Tables 2 and 3). Items were adapted from previous questionnaires that evaluated DCD beliefs, knowledge, and skills in occupational therapists. These items were reviewed by expert DCD therapists, and have been used in multiple studies since 2004 (e.g. Missiuna et al., 2012). Each item used a 7-point Likert scale for responses. In order to describe the sample, background information was collected in the pre-questionnaire (e.g., work setting, number of children with DCD seen per week). In order to document EBP, closed- and open-ended questions were also included in each questionnaire (e.g., in the pre-questionnaire: "Are you confident in your ability to provide EBP for children with DCD? Please

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3 explain”; and in the post-questionnaire: “Do you feel that you, your colleagues or your organization
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5 have changed how services are provided to children with DCD since you first completed the module?”).
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10 **Data Analysis**

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12 To be included in the analysis evaluating immediate impact, PTs had to have completed the background
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14 information questions and, at a minimum, all the questions relating to self-perceived DCD knowledge on
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16 both the pre- and post-questionnaires. To be included in the analysis of the module’s impact over time,
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18 PTs had to complete the additional follow-up questionnaire (an email providing the link to the follow-up
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20 questionnaire was sent directly to PTs by email 2 months following completion of the module).
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27 SPSS Statistics software (PASW 18.0) was used to describe participants’ demographic information, and
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29 ratings of descriptive questionnaire items. Paired t-tests were used to analyze items regarding self-
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31 reported knowledge and skills to: 1) evaluate immediate changes following module completion (pre-
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33 versus post-questionnaires) and 2) retention over time (pre/post versus follow-up questionnaires). Given
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35 the number of t-tests performed, a restrictive p-value of 0.001 was used to determine significance.
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37 Principles of thematic analysis (Brauna and Clarke, 2010) guided the analysis of the open-ended
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39 questions. Specifically, for each question, the first author reviewed the data, assigning codes to each
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41 statement. Codes were then collated to identify principal themes for each open-ended question. Quotes
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43 and codes were reviewed to ensure that identified themes captured the collected data. Themes and
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45 quotes which reflect qualitative findings are presented.
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53 **RESULTS**

54 **Participants**

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3 Sixty-four (64) participants completed the pre-questionnaire; of these, 50 participants completed the
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6 post-questionnaire and were included in the analysis evaluating changes in self-reported knowledge and
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8 skills. The 14 PTs with incomplete post-questionnaires tended to have lower pre-questionnaire mean
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10 scores for knowledge and skills than those completing the post-questionnaire, but no statistical
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12 differences were found between the groups. Figure 1 provides a flow chart describing the number of
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14 PTs participating at each stage. All participants responded to all items on the pre- and post-
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16 questionnaires, with the exception of two participants who did not complete the skills questions (n=48),
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18 and one participant who did not complete the questions regarding the module's utility in increasing
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20 DCD knowledge and skills, and ability to provide EBP (n=49).
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24 [Insert Figure 1 about here]
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29 Table 1 illustrates the demographic characteristics of the 50 participants. All but one of the 50
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31 participants worked primarily as a clinician (with one participant working primarily in research). PTs
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33 worked in different clinical contexts, varied in the number of years of clinical experience (mean: 18
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35 years; SD: 11 years), and the number of years working with children (mean: 13 years; SD: 9 years).
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39 [Insert Table 1 about here]
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44 Seventy percent (70%) of the participants reported working with children who had a diagnosis of DCD;
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46 however, 92% reported that they were working with children they suspected had DCD. Only 18% of
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48 PTs reported working with children with DCD at least once a week; 40% said they might work with a
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50 child with DCD approximately once a month, and 42% said they worked with children with DCD
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52 infrequently (less than once per month).
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Immediate Impact (n=50)

Self-Perceived Knowledge and Skills

Overall, participants' perceptions of the usefulness of the module in increasing their knowledge and skills were high, with mean scores of 6.0 (SD:1.1) and 5.5 (SD:1.0), respectively (n=49). Specifically, 79% of the items evaluating self-perceived knowledge and skills increased significantly following module completion (see Tables 2 and 3).

[Insert Tables 2 and 3 about here]

Self-Perceived Evidence-Based Practice

Overall, participants' perceptions of the usefulness of the information and resources contained within the module in supporting them in providing EBP was high, with a mean score of 6.2 (SD:0.8) (n=49).

Before completing the module, 36% reported they were confident in providing EBP to children with DCD. PTs perceived there were a number of factors influencing their confidence in providing EBP, including the following themes: 1) experience with children with DCD, 2) access to knowledge, EBP resources, colleagues, and training opportunities, and 3) opportunities/constraints of the service delivery model in which they worked. The citations below illustrate their comments:

“Although I am aware of [the] definition, [and] current assessments to help facilitate a diagnosis, I feel I am not fully informed regarding evidence-based interventions, management strategies for the DCD population.”

“[I] feel as though I have not had enough training/exposure to fully understand and treat DCD.”

“I feel I have the general knowledge but because I have just started I need practice.”

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“The treatment of DCD ends up being a lower priority than higher needs children. I feel I have the knowledge but not the resources to treat these kids with such a large caseload.”

Following module completion, almost all participants (92%) reported feeling more confident in providing EBP. The quality and comprehensiveness of the information, and the resources provided were among the principal themes they reported as to why they felt more confident. They indicated that the module saved them time looking for information, and that it provided them with tools for assessing children, as well as planning intervention and evaluating outcomes, which they felt would help promote positive change in the lives of children with DCD and their families. Many PTs indicated that more experience working with children with DCD would now be necessary to reinforce their knowledge base, and they reported that the module videos provided were useful to help them to move their knowledge into practice. Many felt better equipped to help families despite limited resources. Others, on the other hand, reported persistent challenges in: 1) gaining commitment from families, 2) changing their clinical management from impairment-focused to activity-focused, and 3) the time required to implement EBP.

“I knew already about the best evidence but struggled a little as to how to apply these principles. I feel the videos provided a great resource to this application.”

“It is really helpful to actually see [the approaches] in practice on the videos. I just could not get a great understanding of how to put them in practice from reading about them.”

“The module assisted me in realizing that more can be done, even with our limited availability for this group of children.”

“The biggest limitation in providing services is time. I really appreciated the videos, but can't imagine having the time, within my job.”

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3 Immediately after viewing the module, many PTs indicated they would come back to the module to
4 review the information, or, more specifically, if they had a client with DCD. Eighty-six percent (86%)
5 reported that they intended to make changes in their practice. The themes of intended behavior change
6 were quite varied and included: 1) trying to better identify children who might have DCD; 2) use of
7 assessment tools; 3) involving the family and the child more in goal setting; 4) changing their focus of
8 intervention (e.g., participation instead of impairment, increasing capacity-building with teachers and
9 community partners); and 5) sharing more information with families, colleagues, physicians, teachers,
10 and community partners.
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22 *“Yes [will come back]. I don't seem to be able to retain all of the pertinent information into*
23 *long-term memory unless I review it a few times or especially in regards to a real-life*
24 *client, in which case reviewing the information again would be helpful.”*
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29 *“I will use a model to identify the child's or parent's goals/needs to form a more specific*
30 *function-oriented plan.”*
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34 *“[I] think that I will try to use the MABC-2 as my evaluation tool. I would also like to use*
35 *some of the handouts for parents, educators, and coaches. And help families discuss*
36 *concerns with their family physicians regarding DCD.”*
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41 *“I will assess certain children specifically for DCD if I am concerned versus simply*
42 *providing a clinical diagnosis [like] ‘gross motor delay’.”*
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46 *“At my organization, we typically have not treated children diagnosed with DCD, but I*
47 *realize now how many children we see who may have DCD, but are not diagnosed.”*
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53 **Short-Term Impact (n=41)**

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3 Forty-one (82%) of participants completed the 2-month follow-up questionnaire exploring whether
4 changes in self-perceived knowledge and skills were maintained and whether or not they translated into
5 self-perceived practice changes (see Figure 2). Seventy-six percent (76%) had seen between 1 and 10
6 children with DCD within this period, and 46% reported having returned to the online module. One of
7 the primary reasons noted was to address specific needs for a client with DCD (e.g., to prepare a report,
8 to plan an evaluation, to download resources). Not having clients and/or not having the time were
9 reasons noted for not having returned to view the module.
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22 *Self-Perceived Knowledge and Skills*

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24 The increase in knowledge and skills found immediately after module completion was maintained for 24
25 items out of the 27 that were significantly increased in the post questionnaires compared to the pre
26 questionnaires (for those 24 items, mean scores were significantly higher on the follow-up questionnaire
27 when compared with the pre-questionnaire, and mean scores did not differ in the post- and follow-up
28 questionnaires).
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39 *Self-Perceived Evidence-Based Practice*

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41 Approximately one third (34%) reported having changed one or more aspects of their practice following
42 module completion (e.g., starting to refer children for diagnosis, sharing more information and resources
43 with teachers and families). General themes noted as influencing PTs' ability to provide EBP included
44 having access to resources such as evidence-based information, handouts, and site 'champions'. When
45 asked if a virtual community of practice would help them to provide EBP, 83% of the participants
46 agreed, indicating this would help them to create a "bag of tricks" and to seek out other therapists'
47 perspectives on best approaches. Those who were not particularly interested in being part of a virtual
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3 community of practice indicated they already had access to knowledgeable colleagues or were not active
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5 Internet users.
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10 Opportunities for additional professional training and continuous education, the provision of education
11 to others involved in DCD management (e.g., pediatrician), and advocating/raising community
12 awareness were themes also reported as being necessary to facilitate EBP. Having time, funding,
13 research evidence, and service delivery models supporting EBP were also mentioned as important
14 themes. Finally, website resources such as this module were also perceived as a theme contributing to
15 EBP, as highlighted in the following quotes:
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24 *“Access to approved websites backed by academic studies (as opposed to the multitude of*
25 *““blogs”” and ““opinions”” on the internet).”*
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28 *“Having someone/organization who has done all the background work at*
29 *gathering/organizing/structuring the information in such a useable way is a huge facilitator for*
30 *providing EB services to children.”*
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34 *“Education, awareness. I didn't realize that we could provide so much assistance for these*
35 *children prior to this module.”*
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39 *“Opportunities for therapists working with the children to be educated in the evidence-based*
40 *practices. The online module was great because you could take it at home.”*
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44 *“Referring to the module again. Increased awareness overall of all physiotherapists on this*
45 *condition and how to treat it. Increased awareness and diagnosis from [medical doctors] and*
46 *referral to physiotherapy.”*
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55 DISCUSSION
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3 In this study an online module providing synthesized, evidence-based DCD information and resources to
4 support PTs was implemented, and evaluated. Following module completion, participants reported an
5 increase in their knowledge and skills, which was maintained over time. PTs also reported feeling more
6 confident in providing EBP for children with DCD, and in making specific changes to their clinical
7 practice. These finding are important not only in encouraging PTs to use best practice principles in DCD
8 but also in advancing KT science.
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20 From a clinical perspective, study findings highlight how the module helped PTs to begin to shift their
21 focus from impairment-based models towards an emphasis on functional activity and participation,
22 noted to be a knowledge-to-practice gap in PT DCD management (Blank et al., 2012; Hillier, 2007;
23 Rivard et al., 2011). Additionally, PTs reported having used many of the module's practical resources to
24 start to build capacity among families, teachers, and the community, another important area of DCD
25 management that has recently been recommended by international consensus guidelines (Blank et al.,
26 2012).
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39 From a KT science perspective, this study advances the field in a number of important ways. As a web-
40 based resource, this evidence-based module is accessible to PTs when and where they need it, allowing
41 them to return as often as they require for continuing education and access to practical resources.
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43 Relatively few PT studies have explored the utilization of the web to address knowledge-to-practice
44 gaps. Studies that do exist involve primarily adult populations where the online resource is used as part
45 of a larger KT intervention such as a 'community of practice' (e.g. David et al., 2012). This study is one
46 of the first to evaluate an evidence-based online module as a 'stand alone' KT strategy, now available to
47 PTs worldwide. The e-learning literature emphasizes the need for KT interventions to evaluate impact
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3 on changes in practice and patient outcomes, in addition to satisfaction with the online product and
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5 changes in knowledge and skills (Curran and Fleet, 2005). This study not only documented such
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7 changes, but also, over a very short time period, identified concrete clinical practice changes. In fact, the
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9 overall perception of participants regarding the module's usefulness in supporting them in providing
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11 EBP was rated higher than its ability to increase their knowledge and skills. This is important given that,
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13 in other KT studies, researchers have reported limited impact on practice change over longer periods of
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15 time (Ketelaar et al., 2008).
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22 There may be several reasons to explain the behaviour changes noted in this study. Care was taken
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24 during the development of the module to respond to PTs' content and format preferences (Rivard et al.,
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26 submitted). In particular, concrete examples provided in the case scenario and accompanying videos
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28 were reported by participants as being very supportive when applying evidence into practice. Tailoring
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30 knowledge to end-users is noted as a first important step in the KTA Cycle framework (Graham et al.,
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32 2006). Our results highlight the importance of providing user-friendly practical tools and information to
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34 support action into practice. These include tools to: guide interviews, format recommendations and give
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36 to patients, families and community partners. Our findings suggest that by including end-user input
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38 throughout the process, online modules may facilitate implementation and result in clinical behavior
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40 changes.
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49 Our results must, however, be interpreted with caution. Self-reported changes in knowledge, skills and
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51 practice were the primary source of data in this study. The validity of self-reports may not represent an
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53 accurate measure of actual change in knowledge and skills. However, it has been shown that a change in
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55 attitude assists with narrowing the gap between best practice evidence and evidence-based practice
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3 (Lang et al., 2007). In addition, despite our efforts to include a representative sample of all Canadian
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5 PTs a self-selection bias may have also influenced our results, with those more interested in DCD and/or
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7 EBP being more likely to participate in our study. Participants may have had more DCD knowledge than
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9 is typical, as was seen by the higher mean scores in the group of PTs completing the post-questionnaire
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11 compared with those who did not. Despite the fact that retention was high, it is possible that participants
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13 who were less knowledgeable about DCD were overwhelmed by the module content, and are thus less
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15 represented in our sample. Finally, in the short time frame of our study, we were unable to monitor long-
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17 term reported changes, and we did not document the impact of knowledge uptake on client care.
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21 Nonetheless, our results are promising and suggest the need to further explore the use of the Internet for
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23 knowledge transfer and facilitation of research into PT practice.
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29 Ketalaar et al. (2008) pointed out that most KT interventions are aimed at increasing awareness,
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31 understanding, and acceptance around research evidence, but that it is also critical for researchers to
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33 foster and maintain behaviour change. In light of the KT and e-learning research literature, and our study
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35 findings, including the factors identified by participants in our study as impacting their ability to
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37 implement EBP, key steps for developing effective online KT strategies might involve: 1) collaborating
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39 with end-users from the early development stages and throughout when developing online content; 2)
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41 synthesizing and summarizing the currently available research evidence to address end-user content
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43 needs, and developing concrete, 'action-able' tools to supporting practice; 3) creating a network of
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45 supportive 'champions', and 4) developing service delivery models that support the implementation of
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47 research evidence into practice. The current study addressed the two first steps in this process. Future
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49 studies exploring how the online module could be used within a network of 'champions' to influence
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51 service delivery and ease the implementation of EBP will be necessary.
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CONCLUSION

The implementation, and evaluation of an evidence-based PT DCD module contributes to the e-learning resources that will help to narrow the evidence-to-practice gap in the PT management of children with DCD. It is anticipated that this educational resource will continue to support and enable PTs to incorporate current DCD research evidence into their practice, thereby improving client care and health outcomes for these children. The module is now available to PTs worldwide at <http://dcd.canchild.ca/en/dcdresources/workshops.asp>. Next steps include posting a French version of the module and exploring opportunities for examining the long-term impact on EBP.

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Table 1: Participant Demographics

	n (%)
Gender	
Male	5 (10%)
Female	45 (90%)
Province	
Alberta	14 (28%)
British Columbia	18 (36%)
Manitoba	2 (4%)
Newfoundland & Labrador	2 (4%)
Ontario	14 (28%)
Language spoken at work	
English	45 (90%)
English and French	5 (10%)
Primary role within organization	
Therapist	49 (98%)
Researcher	1 (2%)
Work Setting	
Children's Treatment Centre	17 (34%)
School setting	11 (22%)
Hospital	7 (14%)
Private Practice	4 (8%)
Other (e.g., community)	11 (22%)

Table 2: DCD Self-Perceived Knowledge (n=50)

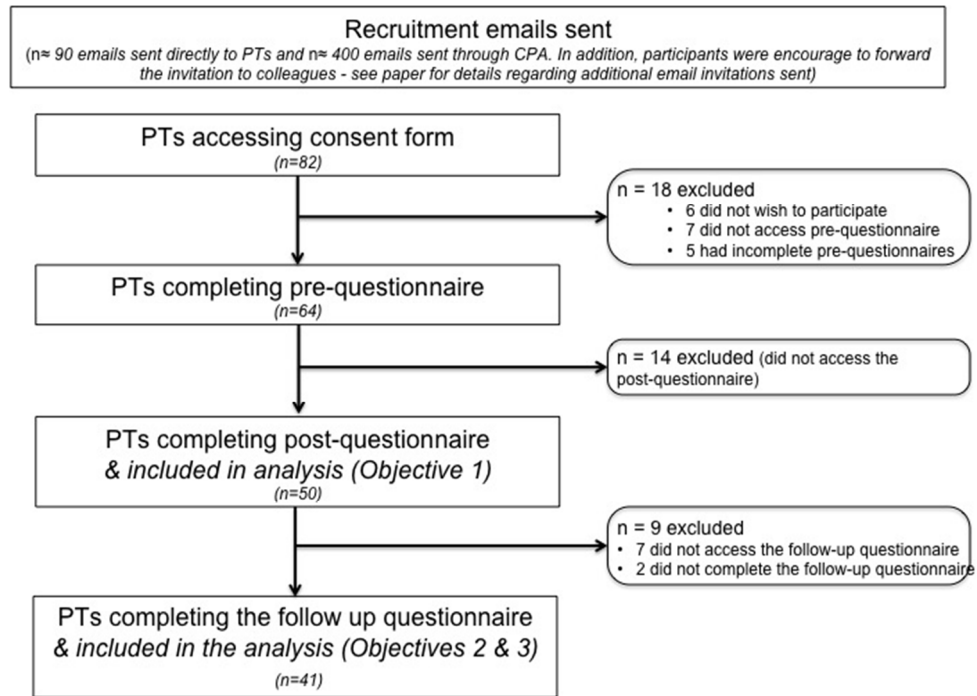
SELF-PERCEIVED KNOWLEDGE	Pre	Post	p
	Mean (SD)		
I know what the typical characteristics of DCD are.	4.62 (1.18)	5.76 (0.80)	< 0.001 *
I believe that I can provide evidence-based services to children with DCD.	4.00 (1.44)	5.48 (1.07)	< 0.001 *
I am aware of DCD resources I can use to support my practice.	4.52 (1.47)	5.98 (0.92)	< 0.001 *
I have a good understanding of DCD as a health condition.	4.42 (1.42)	5.76 (0.89)	< 0.001 *
I am knowledgeable about how coordination difficulties may impact upon children's functioning and participation:			
• at home	4.92 (1.21)	5.92 (0.78)	< 0.001 *
• at school	4.98 (1.20)	5.96 (0.83)	< 0.001 *
• during leisure	5.00 (1.24)	5.98 (0.82)	< 0.001 *
I am familiar with the secondary psychosocial/health issues that commonly develop in children with coordination difficulties over time.	4.44 (1.49)	5.76 (0.96)	< 0.001 *
I am familiar with current evidence regarding interventions for children with coordination difficulties.	4.06 (1.39)	5.58 (0.97)	< 0.001 *
I am familiar with the key features of:			
• task-oriented approach	3.78 (1.22)	5.48 (0.95)	< 0.001 *
• motor learning approach	4.06 (1.13)	5.52 (0.97)	< 0.001 *
• cognitive approach	3.90 (1.36)	5.48 (1.04)	< 0.001 *
I believe that teachers of children with coordination difficulties can learn to support/manage children's needs at school.	5.36 (1.17)	5.68 (1.10)	0.055
I believe that parents of children with coordination difficulties can learn to support/manage children's needs at home.	5.60 (1.05)	5.90 (0.97)	0.038
I believe that community partners and coaches can learn to support/manage children with coordination difficulties' needs in community settings.	5.34 (1.12)	5.60 (1.12)	0.096
I believe that PT intervention can help children with coordination difficulties by changing their:			
• motor impairments	3.78 (1.34)	4.22 (1.36)	0.022
• functional activities	5.26 (1.16)	5.80 (0.83)	<0.001*
• participation	5.48 (1.22)	5.90 (0.84)	0.006

*p=0.001

Table 3: DCD Self-Perceived Skills (n=48)

SELF-PERCEIVED SKILLS (Perceived level of competence with the following skills)	Pre	Post	p
	Mean (SD)		
Recognize typical characteristics of DCD.	4.44 (1.46)	5.67 (0.98)	< 0.001 *
Communicate information to parents to facilitate a diagnosis of DCD.	4.02 (1.52)	5.29 (1.15)	< 0.001 *
Explain DCD to:			
• children	3.44 (1.60)	4.98 (1.18)	< 0.001 *
• parents	3.98 (1.58)	5.40 (1.03)	< 0.001 *
• teachers	3.88 (1.67)	5.13 (1.12)	< 0.001 *
• community partners and coaches	3.73 (1.78)	5.19 (1.10)	< 0.001 *
Assess a child's:			
• motor impairments	5.40 (1.11)	5.81 (0.89)	0.011
• functional activities	5.31 (1.10)	5.75 (0.93)	0.004
• participation	5.00 (1.22)	5.73 (0.94)	< 0.001 *
Involve the child in goal setting.	4.29 (1.46)	5.44 (1.11)	< 0.001 *
Use validated tools to:			
• assess a child with DCD	4.79 (1.61)	5.75 (1.08)	< 0.001 *
• evaluate outcomes	4.35 (1.55)	5.52 (1.11)	< 0.001 *
During intervention, apply principles of:			
• task-oriented approach	3.56 (1.35)	5.40 (1.05)	< 0.001 *
• motor learning approach	3.90 (1.36)	5.40 (0.98)	< 0.001 *
• cognitive approach	3.67 (1.59)	5.29 (1.11)	< 0.001 *

*p=0.001



Flow chart of recruitment
255x177mm (72 x 72 DPI)